Amendments to the Drawings:

New versions of Figures 1-8, having clearer lines, are submitted as requested in the Office Action.

REMARKS

The Office Action of August 2, 2005 has been considered in detail, and Applicants' hereby submit their comments to the Office Action below.

The indication of the allowability of claims 17-27 is noted.

Independent claims 1 and 16 have been amended for clarity, and to remove the requirement for pulses.

The Examiner's attention is directed to the Replacement Drawings submitted concurrently herewith.

Rejection Under 35 U.S.C. §103

Applicants traverse the rejection of claims 1-13, and 16 under 35 U.S.C. §103(a) as being obvious over Crawford (U.S. Patent 5,956,113, in view of Bryan-Brown (GB 2,324,620).

Crawford discloses one embodiment which is a bistable LCD. This embodiment is illustrated in Figure 7 and its operation is described from column 6 line 28 to column 7 line 9. Its possible use to produce a full color LCD is described in column 7 lines 9 to 14 with reference to Figure 4.

In the Crawford embodiment of Fig. 7, a bistable cholesteric LCD has finely-divided silica particles dispersed therein. These particles create a network of silica agglomerates within the bulk volume of the cell to stabilize the texture of the cholesteric LC. Application of a lower voltage V1 causes the cholesteric LC to change from the reflective planar state of Fig. 7(a) to the weakly scattering state of Fig. 7(b). The silica agglomerates stabilize this state when the voltage is removed. Application of a higher voltage V2 causes the LC molecules to align

homeotropically to produce the transparent state shown in Fig. 7(c). The concentration of particles is selected to produce networks strong enough to maintain the scattering state shown in Fig. 7(b) but not strong enough to prevent a spontaneous transition from the homeotropic state of Fig. 7(c) to the planar reflective state of Fig. 7(a) when voltage V2 is removed (col. 6, lines 60-66). Thus, the display of Fig. 7 can be bistably switched from a planar reflective state to a scattering state by application and removal of a lower voltage V1 and can be switched back by application and removal of a higher voltage V2.

Bistable switching from one state to another in the Crawford device is determined by the magnitude of the applied voltage, not the direction of an applied filed. Hence Crawford does not disclose the requirements of the last sub-paragraphs of claim 1 or claim 16.

The Examiner relies on column 4, lines 35-45 to disclose the previously claimed requirements of claims 1 and 16. The cited passage refers to the device of Figures 1-3 of Crawford, that does not have first and second stable molecular configurations. Instead, the device of Figs. 1-3 is a holographically-formed reflective display which is switchable between an off-state and an on-state. As explained at col. 3, lines 44-46 "The off-state occurs when no electric field is applied..." As explained at col. 4, lines 27-29 "In the on-state, a voltage...is applied..." The applied voltage causes the LC molecules to align with the electric field, but this alignment is not stable, since removal of the electric field causes the LC molecules to revert to the off-state.

The device of Figures 1-3 is quite different from the device of Figure 7, in which silica agglomerates must be maintained within the bulk volume of the cell. There is no indication the unidirectional field is applied to the liquid crystal molecules of the structure of Figs. 1-3. One of ordinary skill in the art would not be motivated to combine the embodiment of Fig. 3 with the

device of Fig. 7 to arrive at the combination of applicants' claims 1 and 16 because such an arrangement would not produce the bistable switching for which the Fig. 7 device was devised. Usually field-effect liquid crystals (such as cholesteric liquid crystals) are switched by using AC electric fields because the AC fields reduce unwanted effects, such as injection of charge carriers into the LC. One of ordinary skill in the art would be motivated to employ such AC fields in the Crawford Fig. 7 device because (1) this is usual and (2) it will maintain the silica networks in the bulk volume of the cell. Examples of conventional drive arrangements for cholesteric LCs are found in the enclosed copies of pages 232 and 237 from Reflective Liquid Crystal Displays by Wu and Yang (Wiley-SID) 2001. These pages describe and illustrate drive schemes for cholesteric reflective displays. Fig. 8.30 includes an illustration of AC waveform addressing, and Fig. 8.34 refers both to the voltage and the frequency of the column and row addressing.

Applicants cannot agree with the Examiner's assertion that "it would have been obvious to one of ordinary skill in the art ... to have used nematic liquid crystal material in order to obtain the display characteristics of nematic liquid crystal..." This use of a nematic liquid crystal would not have been obvious because the properties of a cholesteric liquid crystal are necessary for the Crawford display to work the way it does. Crawford acknowledges that such a nematic LCD cannot be switched between stable states by voltage alone; Col. 1 lines 50-62 states:

> A recent type of reflective liquid crystal display is a stabilized liquid crystal display formed with nematic phase liquid crystal stabilized by silica agglomerates dispersed within the liquid crystal. Use of the silica agglomerates allows switching the display between a transparent state and a light scattering state both of which are stable without maintaining the voltage (or electric field) used to switch from the transparent to the light scattering state. However, transition from the transparent state to a reflective state requires thermal recycling, with laser addressing or perhaps use of ultrasound.

Crawford acknowledges that use of a nematic LC does not produce the voltage-controlled bistable switching which is a purpose of the Crawford disclosure (see Crawford claim 1).

Since Crawford teaches away from use of a nematic LC material, one of ordinary skill in the art would have no motivation or incentive to combine the teachings of Crawford with Bryan-Brown. The Bryan-Brown device is not bistable, but has different monostable LC alignments depending on the magnitude (not direction) of an applied electric field. The nematic liquid crystal has negative dielectric anisotropy, unlike the cholesteric liquid crystal used in the Crawford device of Figure 7, which must have positive dielectric anisotropy in order to align parallel with the electric field as shown in Fig. 7(c). Because the Crawford and Bryan-Brown devices work in different ways, one of ordinary skill in the art would not combine their structures with any reasonable expectation of success. The prior art as cited and combined does not teach or suggest all the claim limitations because neither reference discloses bistable switching between different molecular configurations is achievable by using unidirectional fields of opposite direction as claims 1 and 16 require.

Since independent claims 1 and 16 are novel and unobvious over the disclosures of Crawford and Bryan-Brown, and Thurston does not overcome the deficiencies of Crawford with Bryan-Brown, the subject matter of claims 2-15 (which depend on claim 1) necessarily also specify novel and unobvious subject matter, and withdrawal of the rejections of these claims is in order.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance are in order.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 08-2025 and please credit any excess fees to such deposit account.

Respectfully submitted,
David SIKHARULIDZE

Allan M. Lowe

Allan M. Lowe
Registration No. 19,641

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400
Telephone: 703-684-1111
Facsimile: 970-898-0640

Date: October 27, 2005

AML/dll